DOCUMENT RESUME

ED 168 888 SE 027 519

TITLE Science Education Newsletter No. 38.
INSTITUTION British Council, London (England). Science Dept.
PUB DATE Jan 79
NOTE 17p.

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Elementary Education; *Elementary School Science; *Higher Education; *Mathematics Education; *Science Education; Secondary Education; *Secondary School Science
IDENTIFIERS *Great Britain

ABSTRACT

This issue is divided into three sections: (1) Activities in Britain; (2) Overseas and International Activities; and (3) News. Numerous topics of interest to secondary school science and mathematics education pertaining to British education are presented. Included are reports on meetings, college programs, educational research, and educational projects. The overseas section includes information on South Africa, Botswana, Southeast Asia, Mauritius, Zambia, New Zealand, and others. (RH)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

Science Education Newsletter

Issued by the
Education and Science Division
The British Council

ED168888

U S DEPARTMENT OF HEALTH, EDUCATION & WELFARE NATIONAL INSTITUTE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

B.F.A. Humphreys

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC) AND USERS OF THE ERIC SYSTEM."

SE 027 519

January 1979

No 38

Science Education Newsletter No 38

Contents

Activities in Britain

1 The School Science Curriculum: Design and implementation — a British Council course

2 Concepts in Secondary Mathematics and Science Project — Chelsea College

3 The National Association of Manual Training Teachers

4 Walden Precision Apparatus Design Competition

5 Twenty-first London International Youth Science Fortnight

6 Modular Courses in Technology: a Schools Council Project

7 News from the Independent Learning in Science Project

8 MEd — University of Leicester School of Education

9 Postgraduate courses — King's College, London

10 B Phil (Ed) in Mathematical Education — University of Birmingham Faculty of Education

11 DES Committee of Enquiry into the teaching of mathematics in schools

12 A calculator experiment in a primary school

13 Sixth form mathematics for non-specialists

14 SMP 7/13

15 SMP Advanced Mathematics

16 Association of Teachers of Mathematics: Annual Conference 1979

17 Mathematical Association: Annual Conference 1979

18 Tape slide programmes on British Science Curricula: University of East Anglia

Overseas and International Activities

19 Science Education Project, South Africa

20 Botswana Junior Secondary Integrated Science Programme

21 South-east Asian workshop on new trends in Chemistry teaching in schools

22 News from Mauritius

23 News from Zambia

24 British/Japanese Science Education Seminar

25 Out of School Science: New Zealand

26 International Conference on Chemical Education, Dublin, August 1979

24 ICSU — newsletter from the Committee on the Teaching of Science

28 European Journal of Science Education

29 Distribution of Mathematics materials and equipment in Swaziland

30 21st International Mathematical Olympiad

31 Journals in Mathematical Education

32 Workshop on Evaluation of Integrated Science and Mathematics Projects, Seychelles

33 International Conference on Physics Teaching, Israel 1979

34 St Kitts-Nevis Primary Science Curriculum

35 CASME: Awards for Science and Mathematics Teachers 1977/1978

36 Australian Association of Mathematics Teachers

37 ICME Symposium on the Education of Mathematics Teachers

LATE NEWS

38 University of York: Course in Chemistry and Chemical Education

39 Recent and forthcoming Nuffield publications

40 The Diploma in Mathematical Education of The Mathematical Association

41 School Mathematical Competitions in Scotland

© The British Council 1979

Produced in England by The British Council, Printing and Publishing Department, London
2.5/1/79

ACTIVITIES IN BRITAIN

1 THE SCHOOL SCIENCE CURRICULUM: DESIGN AND IMPLEMENTATION — A BRITISH COUNCIL COURSE 2-14 SEPTEMBER 1979

Sustained attempts to improve science teaching in many countries over the past two decades have revealed the complex nature of the factors which shape and control the school curriculum. Problems relating to the purpose, structure and dynamics of the curriculum have had to be defined. Factors which have constrained or facilitated change have had to be identified.

The course will provide participants with an opportunity to discuss these problems and factors in the light both of their own experiences of curriculum reform and of the most recent research findings. The work will be organised around the following themes, the first three of which are concerned with curriculum 'design' and the last three with curriculum 'implementation':

Learners of science
cognitive structures, attitudes to science, the use of language in the learning of science

'School science'
and the nature of science and technology

Social contexts of school science education
vocational/technical contexts and general educational contexts, primary school science in developing and industrialised contexts, the international transfer of curriculum materials

The science curriculum 'in action'
visits to schools and other institutions

Mangement of science curriculum change
school-focussed curriculum development, the role of national and local inspectorate, teachers' centres

Monitoring science curriculum change
national monitoring of pupils' scientific performance, monitoring in the local system and school

Science teachers — the crucial resource
their initial and further professional training; the role of the science teacher in curriculum development

The course is designed for those involved in various aspects of science education, including inspectors of education, teacher trainees, lecturers in colleges and university departments, senior teachers and curriculum development project staff. There are vacancies for 30 members.

The course will be based at the Centre for Studies in Science Education, University of Leeds, and the Course Directors are Professor David Layton and Mr Colin Wood-Robinson of the Centre.

The fee for this residential course is £355 inclusive. Application forms may be obtained from Representatives of the British Council or, where there is no Representation, from: Courses Department, The British Council, 65 Davies Street, London W1Y 2AA.

2 CONCEPTS IN SECONDARY MATHEMATICS AND SCIENCE PROJECT — CHELSEA COLLEGE

Over the past four years, a series of Science Reasoning Tasks (SRTs) have been developed by the Concepts in Secondary Mathematics and Science project at the Chelsea College Centre for Science Education. The purpose of these tasks is to assess pupils' levels of cognitive development in Piagetian terms — that is, to determine whether each pupil in a class is generally capable of

formal operational thinking, the ability to handle abstract ideas;

concrete operational thinking, the 'logical' manipulation of ideas which have a specific, concrete, referent;

preoperational thinking, an apparently irrational, egocentric approach to cause and effect.

The categorisation of pupils in ths way is useful both for the curriculum worker in science and for the teacher, since it provides data which allow for the tailoring of activities to suit the developmental level of pupils.

SRTs have undergone an extensive development programme, including many trials and rewrites, a thorough statistical analysis to ensure reliability and discriminating power, validation by task-task and task-interview correlations, and use in large-scale surveys of school populations.

Each SRT is based on one or more of the experimental situations described by Inhelder and Piaget in *The Growth of Logical Thinking* or one of their other books. The administration of a task involves the demonstration of certain experiments, followed by questions which pupils answer on a special sheet. Giving an SRT is more like teaching than like giving a test, since the administrator is free to rephrase, or explain the questions (in another language where necessary), until s/he is sure that the pupils have understood clearly just what they are being asked. Full instructions are available which allow any competent teacher to administer an SRT without special training.

SRTs may be especially interesting to curriculum workers, teachers, and teacher educators overseas, because

i) they are not standardised with respect to any particular population, but yield data about the quality of the pupils' thinking on a scale which can be described in terms of typical behaviours, and

ii) the flexibility of administration, and the relatively low importance of the exact wording on the pupil's question sheet makes for easy translation into other languages. It also allows for explanation of the questions in dialect in countries where English is the official language of secondary education, but is not the first language of the pupils.

Apart from their use with over 10,000 pupils in the UK, a considerable amount of data is accumulating at CSMS

on the use of SRTs in the Caribbean, Rhodesia, Swaziland, West Bank (Jordan), Kuwait, and the Philippines and other SE Asian countries. In each of these regions, local development work on one or two of the tasks has produced versions suited to their particular needs. In the Caribbean for instance, some 2,000 pupils in Jamaica, Barbados, Trinidad, and Guyana have been tested in a survey of cognitive development in different types of school. The West Indian Science Curriculum has been analysed in similar terms and areas of conceptual difficulty, where curriculum demands greatly exceed typical pupil levels, have been identified.

Some of the 7 SRTs to be published soon by the National Foundation for Educational Research in the UK are:

Task II: Volume and Heaviness

Task III: The Pendulum Problem

Task IV: Flexible Rods.

One which will not be published yet in the UK, but which has had extensive use overseas in Task Ib, Speed and Movement.

For further details on the use of Science Reasoning Tasks, or any other aspect of the CSMS work, please write to

Philip Adey
Chelsea College Centre
for Science Education,
90 Lillie Road
London SW6, England.

3 THE NATIONAL ASSOCIATION OF MANUAL TRAINING TEACHERS

The Association originated in 1891 and out of it has grown the Institute of Craft and Education which is itself composed of teachers and others interested in craft education.

The Institute is represented on examination boards, the Schools Council, the Confederation of Design and Technology Associations, the Royal Society of Arts etc and an annual conference is held at Easter-time each year.

Membership is open to all men and women interested in craft, design and technology subjects. Full membership is for qualified teachers of a particular country. Associate membership is granted to students in training.

All members receive a publication entitled 'Practical Education', a newsletter, conference handbook and buyers' guide each year. There is a benevolent fund.

Members can be enrolled through local branches of the Association or through the Overseas Central Branch. Further information from:

The General Secretary
National Association of Manual
Training Teachers
24 Elm Road
Kingswood
Bristol BS15 2ST.

The College of Craft Education
(Master: Lord Butler of Saffron Walden)

The College interprets the educational aims of the Institute, providing vacation schools and courses for teachers of craft, design and technology in primary, middle and secondary schools. Fellowships can be awarded for research into craft education. Professional correspondence courses are available on a unit credit basis for membership, associateship and fellowship qualifications of the College.

Details are available from:

The College Registrar
35 Park Road
Hemel Hempstead
Herts

Summer schools are held at Carnegie College of Education, Leeds and West Dean College, Chichester. Brochures from:

T Dawson
52 Locarno Avenue
Gillingham
Kent.

4 WALDEN PRECISION APPARATUS DESIGN COMPETITION

In conjunction with the ASE, WPA are launching a competition, the objects of which are;

a. to promote interest in the design and production of scientific apparatus.

b. to effect a closer relationship between apparatus design and present-day teaching methods.

Entries are welcomed from Student/School Teachers/Pupils from Primary to Further Education (excluding Universities and Polytechnics). The entrants must design, test and produce either a completely new marketable piece of scientific apparatus or a novel modification/addition to apparatus currently available.

All new ideas remain the sole right of the inventor(s)

The submitted entry should include:

a. a working example of the new apparatus or modification;

b. some drawings/details of the design, together with a written account of the development.

Awards

The awards to be offered (subject to sufficient entries being received), will be as follows:-

One 1st prize of £500 worth of WPA equipment + £75 in cash.

One 2nd prize of £250 worth of WPA equipment + £50 in cash.

One 3rd prize of £125 worth of WPA equipment + £25 in cash.

Two runners-up prizes of £70 worth of WPA equipment.

Judges

The Panel of judges will include

Mr J Stewart (Director of SSSERC)
Mr D Tawney (Director CLEAPSE)
Mr J V Savage (Director of BEEA),

and two members from the ASE.

Timetable

The closing date for entries will be 30 September 1979. The judging and awarding of prizes will take place during October 1979.

Entry forms are available either directly from WPA, Shire Hill, Saffron Walden, Essex or from the WPA stand at the ASE Annual Meeting at Reading University. (Requests for entry forms must be accompanied by a stamped addressed envelope.)

5 TWENTY-FIRST LONDON INTERNATIONAL YOUTH SCIENCE FORTNIGHT

This will take place from 25 July to 8 August 1979. Participants should be between 16 and 22 years old. The cost, including residence, will be approx £170.

The aim of the Fortnight is to give a deeper insight into Science and its applications for the benefit of mankind, and to develop a greater understanding between young people of all nations. The programme includes lectures, seminars, visits and discussions, as well as social events.

Further information and application forms are available from the Council for International Contact, 9 Grosvenor Gardens, London SW1.

6 MODULAR COURSES IN TECHNOLOGY: A SCHOOLS COUNCIL PROJECT

The Schools Council *Modular Courses in Technology* project has been funded since September 1976 and was based upon the University of Bath Science and Technology Centre and the Avon Science and Technology Centre, Bristol. The project developed from local curriculum development activity in these two areas involving practising teachers, industrialists, and FE lecturers along with the project team and was established because of the concern of the School Technology Forum over the lack of structured courses in technology. It is intended for use in Craft, Design Technology and Science programmes for students in the 14 to 16+ age range. Already some 20 schools have begun courses involving use of the modules in preparation either for CSE or O level examinations. Both the Oxford Local Examination Board and the Southern Universities Joint Board are known to cater for this type of course at O Level, the East Anglia CSE Board has a Mode I Technology Examination and the South Western CSE Board a Mode III Technology Examination. It is expected that other examining bodies will develop examinations in this field at both levels.

The project is based upon the belief that technology is not science teaching emphasising applied science, nor craft teaching emphasising the design aspect, but that it is a problem-solving process which has as its goal the improvement of the quality of human life through technology. Its basic assumption is that examples of knowledge, resources and processes of technology must be specifically taught as a series of modules to be followed by a practical project. Two sets of modules are being developed by the 2 project groups and these are:

Avon/Bath University Modules

1 Energy
2 Design and Problem Solving
3 Material Science
4 Optical Instruments
5 Aerodynamics
6 Electronics

Modules 1 to 3 are Core Modules

Herts/West London Modules

1 Acoustics
2 Electrical Applications
3 Electronics
4 Instrumentation
5 Mechanisms
6 Pneumatics
7 Structures
8 Technology and Man

Trial schools can select modules from either list.

One of the problems caused by such an approach is that many teachers lack the confidence to teach modules of this nature, but to overcome this the project is designed so that Science, Craft, and Technical Studies departments, or a combination of departments, can run the course. Published material will be available in a variety of forms so that those involved in the teaching programme will be able to make the best use of it, appropriate to their own needs and requirements. Each module will have three resource packages.

1 *A Pupil Reader* will include basic illustrated pupil reading material divided into weekly tasks suited to the ability of the pupil.

2 *Pupil Activity Sheets* — practical assignment sheets for each lesson.

3 *A Teachers' Guide* providing an overview of the module with Aims and Objectives, Lesson Guides, lists of apparatus and equipment, visual resources (overhead transparencies and 35 mm slides) and teaching aids.

Formative evaluation will involve attitude and cognitive testing and the resulting feedback will influence the nature of the finally published materials. Summative evaluation will be carried out in the trial schools in Avon and surrounding areas. Two Progress Reports are available and these, together with further information on the project, can be obtained from

Mrs I Irving
Science and Technology Education Centre
School of Education University of Bath
Claverton Down Bath Avon

or

Mr R Pickup
Stevenage Teachers' Centre
Six Hill Way Stevenage Herts SG2 0QA

7 NEWS FROM THE INDEPENDENT LEARNING IN SCIENCE PROJECT

In a recent issue of the newsletter the Secretary provides a forthright introduction making concrete recommendations for the improvement of the use of independent learning materials and resource-based learning in general. He makes an appeal for more articles and information dealing with: (a) assistance to training establishments and advisers in education authorities; (b) articles about independent learning in schools and the use of these techniques in teacher training; (c) information about practical use and the innovation of new kinds of equipment for student use in these situations; (d) information about the use of visual and sound materials by students in independent situations; (e) the general planning of independent learning schemes for school systems.

There is further news, too, of the work of the Resources for Learning Development Unit in Bristol.

This organisation has now passed from an information and resource material gathering phase towards providing school-based in-service training events. These deal with individualised learning situations. One of the outcomes of the programme is a need for the training of teachers in the management of laboratory situations and a system of pupil study tours has evolved which involves the use of test cards in laboratory situations.

Recently two groups of teachers (in Bath and Bristol respectively) have met to develop management packs for the utilisation of specific resource units, and these are now on trial.

8 MED — UNIVERSITY OF LEICESTER SCHOOL OF EDUCATION

The University of Leicester School of Education offers to well qualified and experienced teachers and lecturers a one-year full-time course for the degree of *Master of Educational Studies*.

The course is professionally orientated towards classroom practice. Studies involve current issues seen in historical perspective, monitoring of one's own teaching, examination of the nature of innovation and curriculum change, language in school science, and management of science departments. Units Science Education I and Science Education II are commonly taken in association with a third unit on Assessment and Evaluation.

Further particulars are available from the Secretary, Further Professional Courses, University of Leicester, School of Education, 21 University Road, Leicester LE1 7RF.

9 POSTGRADUATE COURSES IN SCIENCE EDUCATION, LONDON

MEd in Science Education

This one-year full-time or two year part-time course

is intended primarily for teachers of biology, chemistry of physics in secondary schools and for others directly concerned with curriculum development or diffusion in Science Education.

includes the study of Biology, Chemistry or Physics (in the appropriate Departments at the College) and of Education;

is under the joint supervision of the Faculty of Education and appropriate Departments in the Faculty of Natural Science;

MPhil and PhD by Research in Science Education

for those wishing to submit a thesis on an approved topic and in accordance with the Regulations of the University of London;

either by full-time or part-time study.

Additional Information

from the Higher Degrees Secretary, Faculty of Education, King's College, Strand, London WC2R 2LS

10 B PHIL (ED) IN MATHEMATICAL EDUCATION, UNIVERSITY OF BIRMINGHAM, FACULTY OF EDUCATION

This is a one-year full-time course for 1979-1980 open to *graduates* and *non-graduates*, with previous teaching experience, and intended to meet the needs of all concerned with mathematics teaching in schools and colleges. The major component of the course will be an option in Curriculum and Teaching which will concentrate on Mathematical Education within the context of the school curriculum.

Details from the Assistant Registrar (Education), The University of Birmingham, PO Box 363, Birmingham B15 2TT.

11 DES COMMITTEE OF ENQUIRY INTO THE TEACHING OF MATHEMATICS IN SCHOOLS

Mathematics education in both primary and secondary schools has undergone enormous changes in the past 20 years. At present there is a period of stock-taking while the effects of these changes, both within schools and in terms of their relationship to the needs of employers, are assessed.

As part of this stock-taking, the Department of Education and Science have established a Committee of Enquiry into the teaching of mathematics in primary and secondary schools in England and Wales. The 17-member Committee, under the Chairmanship of Dr W H Cockcroft, Vice Chancellor of the New University of Ulster, includes teachers, teacher trainees, those concerned with mathematics education at university level, and representatives of Local Education Authorities and Industry.

The terms of reference of the Committee are: 'to consider the teaching of mathematics in primary and secondary schools in England and Wales, with particular regard to the mathematics required in further and higher education,

employment and adult life generally, and to make recommendations'.

12 A CALCULATOR EXPERIMENT IN A PRIMARY SCHOOL

This is an investigation into the use of hand-held electronic calculators in the teaching of mathematics in a Leicestershire Primary school. The investigation was monitored by three members of the Shell Centre for Mathematical Education in the University of Nottingham, and the principal mathematics adviser for Leicestershire.

The major conclusions are positive and encouraging. The research team found that, sensibly used, calculators can help to improve children's mental arithmetic. 'We find that the presence of calculators in the primary school positively assists the pupil in acquiring computational skills', says the report, and the conclusion is supported by plenty of evidence.

The report would be of interest to anyone concerned with, or about, the effect of calculators on primary school mathematics. It is 'A calculator experiment in a primary school', obtainable from The Shell Centre for Mathematical Education, University of Nottingham, Nottingham NG7 2RD, price £1.00.

13 SIXTH FORM MATHEMATICS FOR NON-SPECIALISTS

The Headmasters' Conference has recently recommended that a mathematics course for sixth formers who are not specialising in the subject should be introduced in all schools. Their report suggests a syllabus which could lead to a GCE examination at alternative 'O' level, but which would not necessarily do so. It further recommends the setting up of a curriculum development project to produce texts for this course. 'The Report on the Teaching of Mathematics to Non-Specialists in the Sixth Form' is available from HMC, 29 Gordon Square, London WC1H OPS, price 60p.

Meanwhile the Schools' Council Sixth Form Mathematics Project materials are available (see SEN 31.7) under the series title 'Mathematics Applicable'. The purpose of this course (also for non-specialists) is to develop an understanding of the logarithmic/exponential function. A series of student texts, Algebra with Applications (£3.50), Calculus Applicable (£1.95), and Logarithmic/Exponential (£1.95) form the main part of an alternative 'O' level course. There are also five 'starter' units designed to fill in gaps in the student's previous knowledge. These are:

Understanding Indices (£1.80)
Geometry from Co-ordinates (£1.60)
Introductory Probability (£1.10)
Polynomial Models (£2.30)
Vector Models (£2.30)

The series in introduced in a discussion unit, Mathematics Changes Gear (90p). The books are available from Heinemann Educational.

14 SMP 7/13 (SEN 33.8, 34.10)

1 SMP 7/13 is a full six-year course in Mathematics for children aged 7-13. The writing team consisted of primary, middle and secondary school teachers, full-time work beginning in 1973. Since then the six Units which make up the course have gone through an intensive cycle of writing in draft form, thorough testing by more than 20,000 children for 2 years, and final editing and publication. Units 1 and 2 were published in March 1977, and Unit 3 in March 1978. Units 4 and 5 will be published in March 1979, and the final Unit 6 in March 1980.

15 SMP ADVANCED MATHEMATICS REVISION

The final book in the Revised Advanced Mathematics Series is now available, and provides, by way of revision exercises, for final preparation for the SMP A-level examination.

SMP Revised Advanced Mathematics, Book 3, available from Cambridge University Press at £4.95.

16 ASSOCIATION OF TEACHERS OF MATHEMATICS: ANNUAL CONFERENCE 1979

The annual conference of the Association of Teachers of Mathematics will take place at the Worcester College of Higher Education, 9-12 April 1979.

Details may be obtained from the Association at Market Street Chambers, Nelson, Lancs DB9 7LN.

17 MATHEMATICAL ASSOCIATION: ANNUAL CONFERENCE 1979

The annual conference of the Mathematical Association will take place in Hull, 18-21 April 1979.

Details may be obtained from the Association at 259 London Road, Leicester LE2 3BD.

18 TAPE SLIDE PROGRAMMES ON BRITISH SCIENCE CURRICULA: UNIVERSITY OF EAST ANGLIA

A series of short tape slide programmes about current secondary level science curricula in Great Britain is now available. Its purpose is: to describe the more important curricula; to give details about the development of the curriculum, the age group and ability range, facts about the publications and other teaching materials; and, most importantly, to give a 'feel' for each curriculum by showing children working in the classroom.

Each programme consists of 36 slides, an audio tape lasting about twenty minutes and synchronised with the slides (alternatively, a tape with an audible signal is available), an A5 sized booklet giving full details about the curriculum, and the script of the commentary on the audio tape.

The following programmes are available:

1 Introduction to the science education system in the UK.

2 Schools Council Integrated Science Project.

3 Scottish Integrated Science Project.

4 Nuffield Secondary Science.

5 Nuffield Combined Science.

5a Combined Science: themes for the middle years.

6 Nuffield O-level chemistry.

7 Nuffield A-level chemistry.

8 Nuffield A-level physics.

9 School Council 5 — 13 Project.

10 Overview of British Science Curricula.

These programmes have been developed by the Chemical Education Sector at the University of East Anglia, Bathurst College, New South Wales, Australia, and the Audio-Visual Centre at the University of East Anglia, with advice from the project organisers.

Individual programmes are available at £15 each (exclusive of postage) and the set of eleven programmes is available at £135 (exclusive of postage). These prices are subject to VAT at standard rate.

Orders to be sent: The Director, Audio-Visual Centre, University of East Anglia, Norwich NR4 7TJ.

INTERNATIONAL AUTOMATIC PULSING SIGNAL
1 Khz 0.45 seconds on B side of cassette

An 'overseas version' of these programmes is being prepared by the British Council and will be available in 1979 in the form of filmstrip and reel-tape.

OVERSEAS AND INTERNATIONAL ACTIVITIES

19 SCIENCE EDUCATION PROJECT. SOUTH AFRICA

Evaluation is proceeding apace with a summary carried out by Nhlanla Jorden (Fort Hare). This report is now available under the title 'An Evaluation Study on the Interaction Existing when a Different Method is Introduced in a Complex System'.

The Project now has a new evaluator Allyson Macdonald who is focussing on six specific areas. 1. The written materials and kit. 2. The orientation course for new project teachers. 3. The difficulties arising when the materials and kit are first used in project schools. 4. The attitudes of the project team members. 5. The attitudes and classroom behaviour of teachers and pupils in science classes. 6. Pupil results.

A variety of methods will be used in the evaluation including questionnaires, observation, written feedback, teacher and pupil interviews, and test and examination marks.

During September the evaluator visited schools that are going to be included in the Prject in 1979. During the visits the lessons were recorded using the science teaching observation schedule developed at the University of Leicester, School of Education.

The standard 6 and 7 examination results from 12 schools are now being analysed. The pupils' responses are being marked and analysed by the Fort Hare Computer Centre, the results will be available next February.

New publications for the Project include 2 standard 8 teachers' guides and the worksheet book.

Last year's trial publications will be revised according to the feedback received. A few new worksheets have been added, more guidance is given on the timing of lessons and a teacher's edition of the worksheet book will be produced.

The work of the Project is beginning to expand into other areas. The Transkei Department of Education has decided to adopt the Project materials for use in their schools and there are recorded instances of other towns wishing to use the materials including Cape Town, Alice, Durban, Port Elizabeth, Kwa Zulu, Ka Ngwani.

During the last week in November 1978 an introductory orientation course is to be held at Fort Hare for all the teachers who will be involved in the Project for the first time.

20 BOTSWANA JUNIOR SECONDARY INTEGRATED SCIENCE PROGRAMME

The botswana Ministry of Education has recently published new pupil worksheets for Units 1, 2 and 10 of the *Science by Investigation in Botswana* course. The worksheets were revised at a writing workshop held in August 1978 which involved serving experienced science teachers. Modifications to the original worksheets were made from teacher report form comments and experience. The new worksheets are more visual and more carefully structured than the original documents.

Accompanying revised teachers' guides for the worksheets are at present being prepared. These are being written to help teachers who may have little in the way of scientific background.

Of the fifteen units of the Botswana course, Units 1, 2, 9, 10 and 11 have now been revised at writing workshops, and pupil worksheets and teachers' guides for these units should be published during early 1979. During 1979 and 1980, the remaining ten units will be similarly revised, with the help of serving teachers.

Further information on the *Science by Investigation in Botswana* course can be obtained from:

Ministry of Education
PO Box 439
Gaborone
Botswana

21 SOUTH-EAST WORKSHOP ON NEW TRENDS IN CHEMISTRY TEACHING IN SCHOOLS 23 - 29 JULY 1978 AT RECSAM, PENANG MALAYSIA

The workshop 'South-east Asian Workshop on New Trends in Chemistry Teaching in Schools' completed RECSAM'S first cycle of seminars, workshops on curriculum development in the science and mathematics subjects taught in schools. The objectives of this workshop were:

(i) to exchange information and share experiences in order to identify new trends and related problems in school chemical education in the SEAMEO region;

(ii) to strengthen regional and national efforts in developing suitable indigenous chemistry curricula.

The participants were key educators from schools, ministries, universities, teachers' colleges and curriculum development centres from within the SEAMEO region and represented Indonesia (3 delegates), Malaysia (4 delegates), Philippines (3 delegates), Singapore (3 delegates) and Thailand (3 delegates). A total of eight observers from universities, schools and the Malaysian Ministry of Education were also present. Six papers were delivered on three chemistry education themes.

Papers on selection of content and related aspects were given by Dr Nida Sapianchai, Institute for Promotion of Teaching Science and Technology, Thailand, Professor Augustin Ong, Universiti Sains Malaysia, Penang, and Mr Lim Chin Kuan, a private chemical analyst from Penang.

The participants prepared a report which covered two aspects of chemistry education. The first aspect was concerned with identifying new trends, problems and solutions in terms of content, teaching approaches, evaluation procedures and teacher training.

Some of the trends identified were:

(a) the development of indigenous curriculum materials with an emphasis towards environmental, agricultural, industrial and humanistic consideration;

(b) the development of alternative curricula for different student populations (eg science, non-science, technical and vocational);

(c) a shift towards activity-orientated and more student-centred classes;

(d) the use of a variety of teaching approaches including multi-media methods;

(e) assessment of understanding, application and science processes;

(f) the use of more varied and relevant approaches to assessment (such as formative tests, criterion referenced tests and standardised tests);

(g) more concurrent integrated assessment of students;

(h) more concurrent/integrated academic and professional training;

(i) more on-going and de-centralised in-service training for teachers.

The workshop also considered the problems that have arisen, and will arise, from the implementation of such trends, and listed possible solutions to such problems.

The second aspect of the report identified some topics that could be included in a chemistry curriculum for schools. Guidelines for developing instructional materials on some of these topics (environmental chemistry, industrial chemistry, food chemistry and agricultural chemistry) were also produced.

22 NEWS FROM MAURITIUS

Although but a small island in the Indian Ocean with many visual delights, there is a considerable degree of education development in train in this far corner of the Indian Ocean.

For example, the Institute of Education was opened in 1974, in new buildings provided with a British Government loan. The Institution has a profound orientation towards finding solutions to local educational problems. One of the more important developments has been the prosecution of one year and two year diploma courses for secondary school teacher training, orientated towards new school curriculum materials and providing a sound training in science methodology for the very first time in the history of the island. Many recruited teacher trainees attend these courses on a part-time day release basis. There is an intention to inaugurate a Bachelor of Education course in the future.

A second responsibility of the Institute deisgnated in its Charter refers to curriculum development, there has been a complete reorganisation of the secondary school curriculum to the level of Form 3 and this has entailed the preparation and massive production of new curriculum materials for both student and teacher, in English, mathematics, science, French, social studies, technical studies, commerce and home economics.

The Institute is also responsible for the primary teacher training college curriculum and is playing a very real part in the localisation of the Cambridge Examination Syndicate O and A level examinations and the primary leaving certificate, in collaboration with the staff of Moray House College of Education in Scotland. To facilitate the impetus of this degree of reform the Director of the Institute of Education reports directly to the Minister of Education, who of course has Cabinet status and can discuss educational problems directly at the Governmental policy-making level.

During recent months, the British Council has provided a consultancy team comprising Mr J Fielden, Mr J Pratt, Mr P Wroe and Mr T Burgess, who are together preparing a report which describes the proposals for reorganising the Ministry of Education. With the provision of so much reform already described, there is a strong case for strengthening the administration of education to imple-

ment the new ideas as speedily as possible. Funds will be provided for the consultancy exercise by the World Bank which has also contributed towards the building and provision of equipment for twelve new junior secondary schools on the island.

The British Council has also provided consultancies in the past dealing with the reform of the examination system and a discussion of the problems associated with post-primary drop-out students.

Further assistance is provided through the ACTS scheme with Mr P M H Davis as the Science Specialist in the Institute of Education itself where he has a particular interest in low-cost science equipment and Messrs Grihauld and Macrae who work together in the primary teacher training college dealing with mathematics and science respectively. They have of late discovered a further interest in the provision of in-service training exercises on the nearby island of Rodrigues.

Finally one should mention a new UNICEF programme which will deal with pre-primary education by this establishment. This is now entering into an active stage of development. Although the island has a concern with the manufacture of sugar which is the chief export from the island, there are evident and significant developments which are aimed at diversifying village life for example the occurrence of young farmers' clubs and youth clubs on a large scale. Considering that this is an island with a total area of approximately 750 square miles, one can say with some justification that Mauritius does not intend to rely entirely on sugar for its future prosperity.

23 NEWS FROM ZAMBIA

The Educational development scene receives a new impetus with a publication by the government of a set of recommendations which indicates priority areas for development of the educational system in the future.

These recommendations can be summarised as follows:

1 There will be a 9 years' programme of universal education without selection for the secondary school.

2 Specialists and teachers will be re-trained to meet requirements for the new curriculum materials and syllabuses. The curriculum will be continuous from Grades 1-12. The core subjects and practical aspects including mathematics, science, production and political education to be a priority.

3 Teachers should participate in educational reform and the Zambian languages should be used extensively in education. Local production of materials and textbooks is required.

4 New examination techniques are required including observation, interviews and non-cognitive methods.

5 Full-time pre-employment training will be preferred to apprenticeship schemes. Trade training institutions will expand and be rationalised. Technician and craft education will be maintained.

6 The minimum entry for teacher training will be Grade 9 or 10 and serving untrained teachers will be admitted to colleges for training. Higher qualifications to be provided by new courses at the University of Zambia. Priority will be given to training of teacher educators especially in science, agriculture, technology and engineering.

The Ministry of Education, the Curriculum Development Centre staff and other educational institutes are now actively engaged in discussions through joint committees to establish the developmental priorities which will receive appropriate funding from both home and aid sources to bring them to the stage of implementation.

Although there is considerable financial stringency in the economic situation of Zambia at the moment, we look forward to a period of new activity in teacher-training and curriculum development both in the primary and in the junior secondary centres of education as a result of these new proposals.

24 BRITISH/JAPANESE SCIENCE EDUCATION SEMINAR

This was organised by the recently established Japanese Society for Science Education, under the Chairmanship of the Vice President of that Society, Professor M Oki. It took place in November at the National Institute for Educational Research in Tokyo.

The British participants were:

Mr Philip Adey - Centre for Science Education, Chelsea College

Professor Peter Kelly - Centre for Science Education, Chelsea College

Dr Clive Sutton - School of Education, University of Leicester

Mr Ted Wenham - formerly Vice Principal, Worcester College of Higher Education

Mr Dennis Chisman - British Council, London.

In addition to the official participants from the British and Japanese side, there were a number of observers from the International and American schools in Tokyo and from the Japanese University Faculties of Education, Teacher Training Colleges and the Ministry of Education.

The main purpose of the seminar was to exchange ideas and information on present and recent practices in science education in the respective countries. It was also the intention to look to the future and to try to identify trends in science education and areas of possible collaboration between professional educationists in the two countries.

As a result of the seminar, it was agreed that three areas of professional interest would justify further collaborative programmes. They are:

1 Concept development - ie how children learn concepts in science;

2 Examinations and assessment;

3 *Decision-making and the implications of science* for society as part of the science Education curricula.

25 OUT-OF-SCHOOL SCIENCE: NEW ZEALAND

Two activities are reported in the Auckland Science Teachers Newsletter. One, the Auckland Schools' Science Exhibition 1978 attracted 200 entries from 44 schools. The exhibits were shown in the Museum which had eighty thousand visitors during that period.

The second, the Philips New Zealand Science Fair is sponsored by Philips Electrical Industries. In the finals there were 24 exhibits from nine regional fairs. These were seen by 35,000 people in the nine day period of exhibition. The event has been the subject of three programmes by South Pacific Television.

26 INTERNATIONAL CONFERENCE ON CHEMICAL EDUCATION, DUBLIN, AUGUST 1979

The Conference, entitled 'The Teaching of Chemistry - interaction between secondary and tertiary levels' will take place from August 27 - 31, 1979 at the New Conference Centre of Trinity College, Dublin, Ireland.

The object of the Conference is to clarify the purpose of School Chemistry Courses and of First Year Higher Education courses, for students who will specialise in chemistry at the higher levels as well as those who do not. The influence of the Universities on school curricula will be discussion, and the transition from one level to the other.

The programme will include plenary position papers, Poster sessions and regional reviews.

Further information can be obtained from the Conference Officer, Department of Chemistry, University College, Belfield, Dublin 4, Republic of Ireland.

27 NEWSLETTER FROM THE COMMITTEE ON THE TEACHING OF SCIENCE

The International Council of Scientific Unions, through its Committee on the Teaching of Science, is anxious to provide a means by which people can be informed on developments in science education and which can be used for the general exchange of information. It is hoped that a Newsletter will help meet this need. It is intended to issue it at least twice a year, and number 1 appeared in July 1978.

Contributions are requested for future issues and should be sent to the editor who is Mr J L Lewis, Malvern College, Malvern, Worcestershire. Descriptions of projects, controversial comments, information on future meetings, reference to publications, reports and interesting curriculum materials are suitable for publication.

28 *EUROPEAN JOURNAL OF SCIENCE* EDUCATION

This new journal is intended to bridge the gap between the research level and teachers and will disseminate information about science teaching throughout Europe.

The scope of the journal will range through separate sciences, geology, technology and integrated science. It will report research to teachers at primary, secondary and tertiary levels.

The writing is in English with summaries of principal items in French, German and Spanish. The first volume contains 17 articles written by eminent educators dealing with:

1 Innovation and Developments (eg Science and Technology in the classroom by W H Dowdeswell)

2 Research Reports (eg Concept Formation in Biology: the concept 'Growth' by G Schaefer)

3 News and Information (eg the UNESCO/UNEP programme in environmental education by G Enlefeld)

4 Reports from Research Centres (eg A Research Approach to Science Education in Groteburg by D Lybeck)

5 Book Reviews.

The journal is published by Taylor and Francis Ltd, 10-14 Macklin Street, London WC2B 5NF, at £20.00 per annum for 4 issues in the United Kingdom.

29 DISTRIBUTION OF MATHEMATICS MATERIALS AND EQUIPMENT IN SWAZILAND

Swaziland has approximately 80 secondary schools of which about 50 are junior secondary schools going only to form 3. For mathematics teaching, SMP texts are used throughout these schools, including a local adaptation.

Schools' needs for equipment for the course have been met by the setting up of a Secondary Mathematics Materials Fund based at the In-service Unit in the Teacher Training College. This is a rotating fund through which materials of various kinds are purchased and then sold at cost to schools.

Equipment and materials supplied

1 Imported equipment

Circular slide rules are imported in bulk (1000 at a time) direct from the Japanese manufacturer. The present price is equivalent to about £0.78.

Circular protractors, beads for abacuses etc., are purchased from educational suppliers in the UK.

2 Locally produced equipment

A workshop in the college makes the following:-

(a) abacus bases from chipboard and bicycle spokes.

(b) graph boards from hardboard, scored with an electric saw,

(c) nail boards from chipboard and nails,

(d) mirrors from off-cuts from the local hardware shop.

3 Printed materials

Several supplementary booklets have been produced for the School Certificate course. These are printed and collated in the college. Books of past examination papers are imported. Locally produced booklets of revision notes are purchased in bulk.

Distribution

Swaziland is a small country and communications are relatively easy. Small parcels are posted. Teachers also call in to collect materials or they can be delivered by In-Service Unit staff members on school visits.

About 75% of all secondary schools regularly make purchases through this fund.

30 21ST INTERNATIONAL MATHEMATICAL OLYMPIAD

The International Mathematical Olympiad was inaugurated in 1959 in Romania, and it has been an annual event since then. Only once, however, has it taken place outside one of the Eastern European countries (Austria, 1976). Britain has participated each year since 1967.

At the 20th Olympiad (Romania, 1978) an invitation from Britain to host the 21st Olympiad was accepted. Accordingly it will take place at Westfield College, University of London, 2 - 6 July 1979. About 20 national teams are expected to take part.

31 JOURNALS IN MATHEMATICAL EDUCATION

A list of journals in mathematical education has been compiled in the Schools and Further Education Department of the British Council, London and is available free on request.

It is based on one compiled by Mr Jerry P Becker, of the North Illinois University, USA, for the External Affairs Committee of the National Council of Teachers of Mathematics (USA). The immense amount of work involved in this original compilation is gratefully acknowledged. A number of recent amendments and additions have been incorporated.

The list attempts to cover the whole range of journals from an occasional duplicated newsletter to regular and substantial publications, where the content concerns mathematics education at school and teacher training levels.

32 WORKSHOP ON EVALUATION OF INTEGRATED SCIENCE AND MATHEMATICS PROJECTS, SEYCHELLES (SEN 36.19)

The report of this workshop is now published and available on request from Schools and Further Education Department, the British Council, London. It contains a lead paper on evaluation by the UNESCO Specialist Edward Jacobsen, and detailed accounts of the development of new curricula in integrated science and mathematics at Junior Secondary level in Ghana, Kenya, Lesotho, Mauritius, Nigeria, Seychelles and Swaziland.

33 INTERNATIONAL CONFERENCE ON PHYSICS TEACHING - ISRAEL, 1979

The conference is arranged by GIREP (International Group for the Advancement of Physics Teaching) and will take place from August 19 - 24, 1979 at the Weizmann Institute of Science, Rehovot, Israel. The official language is English.

The conference aims to review two topics:

1 Oscillations and waves - the teaching of both classical and contemporary ideas.

2 Current problems in physics teaching - teaching culturally deprived students, or mixed ability groups, and social aspects of physics education.

Write for further information immediately to Dr Hanna Goldring, Science (Teaching Department, Weizmann Institute of Science, Rehovot, Israel.

34 ST KITTS - NEVIS PRIMARY SCIENCE CURRICULUM

This curriculum outline was initiated and devised during a workshop held at the Teachers' College, Basseterre in February 1978. The participants developed all the materials. They were drawn from St Kitts, Nevis and the Teacher Training College with Mr Colin Lancaster, Consultant of WICS.

The content of the new curriculum is divided into several different topics. 'Living things' includes work on environmental aspects, growth and classification. The second topic called 'Matter' includes exercises dealing with soil, rocks, metals, plastics, glass, rubber, water, solutions and air. The third topic is called 'Energy' and deals with machines, heat, light, food and fuel, sound, electricity and magnetism. The final topic is called 'Time and Space', and deals with weather, the earth and the solar system, agricultural change, pollution and conservation, corrosion and erosion, adaptation to change and resources. The authors have already published a teacher's guide which includes a short section dealing with assessment.

35 COMMONWEALTH ASSOCIATION OF SCIENCE AND MATHEMATICS EDUCATORS (CASME)

Awards for Science and Mathematics Teachers 1977/1978

17 entries were received from:
England, Hong Kong, India, Jamaica, Malaysia, Malta, Nigeria, Sierra Leone and Zambia.

Judging has now been completed and the results are as follows:-

First Prize (£150)

Mr W M Gibbs, Zambia

'A Case Study in Improvisation'

Improvising Mathematical Apparatus from waste material, for use in Primary Level Mathematics.

Second Prize (£100)

Mr E Sawyerr, Sierra Leone

'The Role of Traditional Belief in the Teaching/Learning of Science in Sierra Leone'

An account of an investigation carried out by pupils in the relationship between traditional belief and Science

Third Prize (£50)

Miss B Yeow, Singapore

'A Teaching/Learning Kit, Using Batteries and Bulbs'

An account of the design and production of a set of learning experiences in kit form.

The following entries were highly commended:

Mr V G Devonald, England

'Economic Biology'

An account of the development, planning and teaching content of a course on Economic Biology.

Mr T G Ooi, Malaysia

'The Synthesis of Water'

Modification of apparatus for the synthesis of water, to be carried out safely by pupils.

36 AUSTRALIAN ASSOCIATION OF MATHEMATICS TEACHERS

The Eighth Biennial Conference of the Australian Association of Mathematics Teachers will be held from January 14 to January 18, 1980, at the Australian National University at Canberra. The theme will be 'Mathematics: Theory into Practice'. The following key speakers have accepted invitations: Miss Edith Biggs (former HMI) and Professor Brian Griffiths (Southampton University) of Great Britain, and Mr Stanley J Bezuska of the United States.

Further information may be obtained from the Conference Co-ordinator, Ms Lois Boyd, ACT Schools Authority, PO Box 20, Civic Square, 2608 ACT, Australia.

37 ICME SYMPOSIUM ON THE EDUCATION OF MATHEMATICS TEACHERS (SEN 37.27)

This symposium took place during the International Congress of Mathematicians, in Helsinki, Finland, August 15-23, 1978. The symposium worked on four afternoons of the Congress, the theme being 'What Knowledge, Experience and Understanding of Mathematics should a Mathematics Teacher have?'.

The programme consisted of addresses by distinguished mathematicians, and panel discussions. British speakers were Professor H B Griffiths (University of Southampton), Dr T J Fletcher HMI, and Professor D Wheeler, now of Montreal, Canada.

One limitation of concern to readers of SEN is the very little attention paid to the problems of developing countries, despite contributions from Professor U D'Ambrosio (Campinas, Brazil), Professor S Toure (Ivory Coast) and Dr Jose A Marasigan (Philippines). Most attention was focused on the aspect of mathematics teacher education as transferring to student teachers a body of mathematical knowledge, and the affective domain was largely overlooked. A particularly stimulating contribution was made by Professors Shumaker and Leenderts of the Dutch Centre IOWO in Utrecht.

LATE NEWS

38 UNIVERSITY OF YORK: COURSE IN CHEMISTRY AND CHEMICAL EDUCATION (SEN 29.3)

In a previous edition details of a course for school and college teachers in Chemistry and Chemical Education at the University of York were given. The course is in two parts. The first, which lasts one term (12 weeks), is self-contained and designed to enable teachers to study modern aspects of chemistry *which are directly related to their teaching* and chemical education. The laboratories are open extensively to enable teachers to use their time most effectively. The second part, which lasts two terms, is concerned with a research project, either in chemistry or chemical education. Successful completion of both parts of the course leads to the award of an MSc degree.

A further interesting development has evolved for overseas teachers. Some have spent one term at York (Pt.I) and are doing the Part II research work in their own country with some assistance from interested University departments near their college or school. Formal supervision is still with the University of York. While there is a disadvantage in such a scheme of being so far away from the supervisor, there is a significant advantage in that the research work can be very closely related to local conditions.

Further details can be obtained from Professor D J Waddington, Department of Chemistry, University of York, Heslington, York, YO1 5DD, UK.

39 RECENT AND FORTHCOMING NUFFIELD SCIENCE PUBLICATIONS

1 *Revised* Nuffield Chemistry

The following books were published in 1978

Handbook for Pupils (for use with Stages II and III)	£ 3.95
Teachers' Guide II	£15.95
Teachers' Guide III (the guide to the Option booklets)	£10.00

The remaining titles in the chemistry revision are as follows:

Chemists in the World, background reading for use with Stage II and the Options, will be published in June 1979 (probably price £2.50)

Masters for Overhead Projection will be published in May 1979 (probably price £10.50)

Two slide series for Stage II to be published in June 1979

Structures of Substances (colour) (probable price £4.00)

Chemicals and their Uses (black and white) (probable price £3.00)

2 *Revised* Nuffield Physics

Further recent additions to the Revised Nuffield Physics books are:

Pupils' Text Years 1 and 2	£ 3.20
Pupils' Text Year 4	£ 4.15
Teachers' Guide Years 1 and 2	£ 8.75
Teachers' Guide Year 4	£ 9.50

The *Pupils' Text* and *Teachers' Guide* for Year 3 are already published, as is the *Genral Introduction*

The books for Year 5, *Pupils' Text Year 5* and *Teachers' Guide Year 5* should be published in time for September 1980.

40 THE DIPLOMA IN MATHEMATICAL EDUCATION OF THE MATHEMATICAL ASSOCIATION (SEN 34.12, 35.9, 37.9)

Further information about the Diploma is now available.

The Diploma in Mathematical Education is a qualification for teachers, with its emphasis on teaching children in the 5-13 age range. Its purpose is to equip suitable and interested teachers to make a strong personal contribution to the teaching of mathematics within their own schools; it is particularly appropriate for those who hold, or who hope to hold, positions of responsibility for mathematics in first or middle schools. Candidates for the Diploma must have at least 2 years teaching experience, but the Mathematical Association does not require them to have a formal mathematical qualification.

The Mathematical Association acts as a validating body for the Diploma, thereby ensuring that its holders have achieved a standard of national significance. The Diploma is implemented under the supervision of a Diploma Board of 15 members, who cover between them a wide range of experience in higher education, educational administration, school teaching and industry.

Courses for the Diploma are provided by institutions, suitably staffed and equipped, which propose syllabuses and schemes of assessment for approval by the Diploma Board. A first list of institutions which have received such approval appeared in SEN 37.9.

Courses involve at least 200 hours of teaching contact time, usually spread over 2 years of part-time study, with occasional tutorial sessions. In addition, candidates are expected to undertake in their own time a substantial amount of private reading, mathematical enquiry and observational study of mathematics learning in the classroom.

The preparation of a detailed scheme of work is the responsibility of the institution providing the course. However, all courses cover two main areas of study, which are closely linked together in the scheme of work:

1 **Mathematical content for teachers,** including, but necessarily going beyond, those topics that would normally be taught to children in the first and middle years, and preparing the way for a Mathematical Investigation required as part of the assessment for the Diploma.

2 **Mathematical education,** including consideration of the curriculum, and how mathematics is taught and learnt, preparing the way for an extended Special Study of a child, or group of children, learning mathematics, required as part of the assessment for the Diploma.

The assessment scheme is designed to reflect the interaction between mathematical content and mathematical education, and the approximately equal emphasis to be placed on them during the course. The following four elements are each graded on a 5-point scale, A to E:

1 Mathematics
2 Mathematical education
3 Special study
4 Mathematical investigation

Two A grades, together with other grades of C or better, constitute a distinction award; one E grade or 3 D grades constitute failure.

All enquiries about the Diploma should be addressed to:

The Secretary of the Diploma Board (ME)
The Mathematical Association
259 London Road
Leicester LE2 3BE

41 SCHOOL MATHEMATICAL COMPETITIONS IN SCOTLAND

There are four mathematics competitions run on a Scotland-wide basis in schools. Three come under the auspices of the Scottish Mathematical Council, and the other is organised by the University of Stirling.

1 **Mathematics Project Competition for Primary Schools**

The competition at primary school level takes the form of a project, which may be on any theme provided it has adequate mathematical content. Twenty-five entries were received for the 1978 competition, the standard being fairly high. A panel of judges is drawn mainly from Colleges of Education, and seven awards were made, with a further seven 'honourable mentions'.

There is an annual exhibition of entries, combined with the presentation ceremony. In addition, the award winning entries have been photographed and a tape/slide exhibition prepared for information and inspiration of other primary schools throughout Scotland.

Further information may be obtained from Mr H Clink, Adviser, Strathclyde Regional Council (Dumbarton), 47 Macleod Drive, Helensburgh, Scotland.

2 **Mathematics Project Competition for Secondary Schools**

In 1978 this competition attracted thirty-two entries from 18 schools. As with the primary competition, the standard was high. The panel of judges is drawn mostly from university mathematics departments, and awards are made at three levels, to pupils in Forms 5 and 6, those in Forms 3 and 4, and those in Forms 1 and 2.

This year, a total of 13 awards were made, together with six 'honourable mentions'. A public exhibition of entries is held.

Further information may be obtained from Mr I Mitchell, Assistant Rector, Inverkeithing High School, Inverkeithing, Fife, Scotland.

3 **Mathematical Challenge**

This is a problem solving competition for secondary school pupils in Scotland, which started in 1977. There are four separate papers, which in 1978 each consisted of four questions, without choice. As with most such school mathematics competitions elsewhere, the emphasis is on problems which require ingenuity and insight rather than detailed syllabus knowledge.

Further information may be obtained fromd Dr D Monk, Department of Mathematics, University of Edinburgh, James Clerk Maxwell Building, The Kings Buildings, Edinburgh EH9 3JZ, Scotland.

4 **The University of Stirling School Mathematics Competition**

This annual competition takes place at Stirling University, and is open to fourth and fifth-year secondary pupils throughout Scotland. Eight problems are attempted in 2½ hours. An interesting feature is that competitors are allowed to bring books and other aids into the examination room, though the questions are such that mathematical insight is more important in their solution than extensive knowledge of routine school mathematics.

Ten prizes are awarded annually. Further information may be obtained from Dr R M F Moss, University of Stirling, Stirling, Scotland.